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TRANSACTIONS
of
THE NEW YORK ACADEMY OF SCIENCES

SER. II, VOL. 7 DECEMBER, 1944 No. 2

SECTION OF GEOLOGY AND MINERALOGY

NOVEMBER 6, 1944

DOCTOR S. H. KNIGHT, Professor of Geology, University of Wyoming, Laramie, Wyoming: *The Physical Evolution of the Rocky Mountains of Southern Wyoming.* (This lecture was illustrated by black-board diagrams.)

The Rocky Mountain Region was pictured as it existed prior to the first orogenic disturbances in Late Cretaceous time. The rocks involved in this disturbance consisted of (1) a thick succession of fine textured Mesozoic sediments resting conformably upon (2) a thinner succession of Paleozoic rocks which in turn rested unconformably upon (3) the pre-Cambrian complex. The Mesozoic rocks were described as an alternating succession of marine and continental sediments which were derived from highlands lying to the west of the Rocky Mountain Region. Crustal warping was pictured as having produced elongate islands which rose in the Late Cretaceous sea which was thereby broken into a series of embayments and estuaries. The island uplifts were attacked by erosion and the resulting fine textured rock debris derived from the older sediments was deposited in the adjacent downwarped basins. The upper portion of the thick Mesozoic succession now exposed on the basin floors was pictured as having been reworked sediments locally derived from the rising mountain flanks. Conglomerates derived from the lower part of the Mesozoic and underlying Paleozoic rocks which occur a few hundred feet above the last marine Cretaceous

TRANSACTIONS of the New York Academy of Sciences, Series II, Volume 7, No. 2, December, 1944.
This publication is distributed to Members and is published monthly from November to June, inclusive, at 109 West Chestnut Street, Lancaster, Pa., by The New York Academy of Sciences, Seventy-ninth Street and Central Park West, New York City.
Editor: Roy Waldo Miner.
Executive Secretary: Eunice Thomas Miner.
Entered as second-class matter December 2, 1938, at the post office at Lancaster, Pa., under the act of August 24, 1912.

faunas were given as evidence that the mountains had suffered prolonged erosion before the final withdrawal of the Cretaceous sea. The time of the final withdrawal of the sea, with respect to the depth of erosion in the mountains, is not known.

Uplift and erosion of the mountains continued throughout Paleocene time and coarse-textured debris composed of mixtures derived from the pre-Cambrian and the flanking sediments were deposited along the flanks of the mountains while finer sediments were laid down in the central portion of the basins. The mountains gradually gained elevation with respect to the basin floor throughout Paleocene time. Intense orogenic movements at the close of Paleocene time resulted in extensive folding, thrust and tear faulting. The mountains were pictured as having reached their greatest relative height at this time. During Lower Eocene time extremely coarse-textured conglomerates which grade rapidly basinward into fine sediments were deposited upon older rocks. The marked unconformity between the Lower Eocene rocks and underlying rocks was shown to become less apparent when traced basinward. The last compressional movements which folded the rocks occurred following the deposition of the Lower Eocene succession. These rocks were locally folded although they remain in nearly a horizontal position over large areas.

Middle and Late Eocene rocks are absent, and the record of events is therefore less well documented. The following conditions were illustrated: (1) Erosion greatly reduced the mountains and broad erosional surfaces were cut on the pre-Cambrian rocks. (2) The basins were deeply excavated and the mountains were dissected. During Oligocene time, reworked volcanic ash partially filled the basins and the mountain canyons. These deposits covered the lower mountain drainage divides. Some coarse-textured debris from the mountains was intercalated with the fine ash deposits. The Oligocene ash beds were covered with conglomeratic and arkosic debris mixed with ash in Miocene time. The region was pictured as having suffered regional uplift in late Miocene time with the accompanying superposition of the drainage. Little is known of the Pliocene history. Some Pliocene sediments were deposited. Mention was made of the occurrence of local erosional surfaces cut at various elevations and at various times during the final excavation of the basins.

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SECTION OF PSYCHOLOGY

NOVEMBER 20, 1944

DOCTOR WOLFGANG KOEHLER, Department of Psychology and Education, Swarthmore College, Swarthmore, Pa.: *New Facts in Visual Perception.*

In 1935, J. J. Gibson discovered several "figural after-effects." He found that when the middle of a slightly curved line had been fixated for some time, a straight line in the same location and orientation appeared curved in the opposite direction. From this and similar observations he concluded that, under conditions of prolonged inspection, lines which deviate from a norm, for instance, from the straight line, change in the direction of the norm; and that, as a result, the norm itself is correspondingly distorted if it is shown in the same part of the visual field.

More recently, Dr. Wallach and I have shown that, after prolonged inspection of any specific object, the metric characteristics of the visual field, both within and around the area of that object, are temporarily changed. The only condition which must be fulfilled is that the brightness of the object differs from that of the ground. It is not necessary that the object represent a deviation from a visual norm. Inspection of norms themselves gives rise to after-effects when proper test objects are chosen.

Within a given inspection object, various after-effects can be demonstrated, depending upon the choice of the test pattern and of its position relative to the area of the previously inspected object. This makes it advisable to distinguish between two facts: (1) *Satiation.* After inspection of an object, the parts of the visual cortex in which this object is physiologically represented are in a changed condition. It is here assumed that a visual figure is associated with a specific figure process, and that continuation of this process in a given area causes the changed condition of the medium. (2) *Figural after-effects.* The figure process of a test object reacts upon that changed condition so that the appearance of the test object is affected.

Apart from minor symptoms, figural after-effects consist in *displacements.* Test objects are either displaced as wholes, or parts of

these objects are shifted. In the latter case, test objects may suffer changes of size, or they may also be distorted. The direction of the effects is that test objects (or parts of such objects) recede from highly satiated regions of the field into less affected regions. Satiation is maximal within, and in the neighborhood of contours or outlines. If the inspection object is a circle and the test object a smaller concentric circle, this smaller circle will appear too small. Its contour moves inward, away from the maximally affected zone. Conversely, if the inspection object lies within the area of the test object, the latter will for the same reason appear too large. The changes are observed and measured by comparison with like objects in an unaffected region of the field.

When a test object is displaced, the degree of its displacement depends upon its distance from the previously inspected object. Within certain limits, a test object recedes less when it lies nearer the inspection object than it does at greater distances. In other words, the effect grows as the test object is placed in positions which are more and more on one side of the affected area. However, since, at very great distances, the process of the test object becomes independent of the affected area, displacements are maximal at a certain distance.

From this, it follows that if the parts of a straight test line lie at varying distances from an inspection object, such a test line must turn in space. It may turn as a whole, or its parts may turn in varying degrees so that a curve results. Both effects can be easily observed. In fact, Gibson's observations are examples of such effects.

Gibson's further finding that during prolonged inspection figures may change their *own* shape, can also be derived from the same principles: If satiation is greater on one side of an inspection line than it is on the other, the line will move in the latter direction. As a consequence, great caution is indicated, whenever for the purpose of accuracy in measurements visual patterns are shown a great many times in succession. Under these circumstances, the size, the shape, and other characteristics of the patterns are likely to undergo a gradual change by self-satiation. Thus, the disappearance of many visual "illusions" under conditions of repeated observation need not be a "practice" effect; for, in such patterns, satiation must be expected to operate against the asymmetries which constitute the illusions.

Quite recently, we have found that figural after-effects occur in the third dimension of visual space just as they do in the first two.

Practically any effect which has been observed within a plane parallel to the observer can also be demonstrated as a distortion at right angles to this plane. The only major difference is that, in the latter case, the phenomena tend to be more conspicuous. Where the order of magnitude of an effect, in the former case, is a few millimeters, the corresponding effect in the third dimension amounts to several centimeters.

It takes no more than a few seconds to establish a satiation which causes a figural after-effect, and the amount of the effect does not grow if the inspection period is prolonged beyond a few minutes (Gibson). By a summation technique, it can be shown that some satiation originates within a fraction of a second. On the other hand, satiation persists during periods which are enormous in comparison with the inspection time during which it was established.

Satiation can not be interpreted as a retinal change. Although some such effect may occur at any level, the main effect, undoubtedly, has a more central location. If, during the satiation period, only one eye sees the inspection pattern, a clear after-effect will be observed if the test pattern is shown only to the other eye (Gibson). At the same time, the effects are localized in the sense that distortions occur only within the affected area or in its neighborhood. The spatial coordinates which are here decisive are those of the retina or, rather, those of the visual cortex. This holds also for the effects in the third dimension.

Measurements show that individual differences as to the amount of the distortions are very great. This amount also varies from one part of the field to another. For instance, it seems to be greater in the periphery.

We do not believe that an explanation of figural after-effects can be given in terms of traditional neurophysiology. An interpretation in less conservative terms has been suggested elsewhere (4, 5, 6). Quite apart from any particular theory, the existence of figural after-effects seems to prove that specific objects in visual space are associated with specific processes (figure processes), which alone cause satiation. This fact appears to be incompatible with the notion that specific objects are established by learning, *i.e.*, that they have no genuine visual existence. Similarly, the occurrence of strictly analogous after-effects in the third dimension excludes all theories according to which this dimension has an indirect origin and is therefore not actually a visual datum. Again, the so-called "cues" for localization in the third dimension seem to

operate just as directly as does binocular parallax. For, so long as depth is clear, figural after-effects in the third dimension can be easily demonstrated when parallax is absent during the inspection period.

REFERENCES

1. **Gibson, J. J.**
1933. Jour. Exper. Psychol. **16**: 1.
2. **Gibson, J. J. & M. Radner**
1937. Jour. Exper. Psychol. **20**: 453.
3. **Gibson, J. J.**
1937. Jour. Exper. Psychol. **20**: 553.
4. **Köhler, W.**
1938. The Place of Value in a World of Facts. Liveright Publ. Corp.
5. **Köhler, W.**
1940. Dynamics in Psychology. Liveright Publ. Corp.
6. **Köhler, W. & H. Wallach**
1944. Proc. Am. Philos. Soc. **88**: 269.

DOCTOR DONALD MARQUIS, Director of the Office of Psychological Personnel, National Research Council, Washington, D. C.: *Psychology in the War.**

The growth of psychology since the last war has provided a much wider opportunity for its contribution in the present war. The major task of professional psychologists in the Armed Services is research on the human factor in connection with the following problems: (1) the analysis of military tasks and occupations; (2) the development of tests and procedures for selection and classification of personnel; (3) the development of training programs and methods of evaluating training; (4) the design of instruments and weapons from the standpoint of the traits and capacities of the personnel using them; (5) the development of clinical techniques and procedures for individual examination and consultation services; (6) the study of psychophysiological factors, such as vision, hearing, fatigue in the performance of specialized military tasks; (7) the development of techniques and procedures in the orientation program, in morale services, and in psychological warfare. Military psychologists also undertake the supervision of the administration of practical programs arising from the results of their research investigations. Routine duties of group-test administration and scoring, interviewing, classification, and assignment, are carried out by commissioned and non-commissioned personnel receiving the necessary special training in service schools in which psychologists participate as instructors.

When preparation for the present war was undertaken in 1940, the Services were without qualified psychologists or established research programs in this field. Beginning with a few individuals in key positions, the Army, Navy and Air Forces now utilize more than one thousand qualified psychologists in specialized work and some 250 more are serving in civilian status in the War and Navy Departments and in the work of the Office of Scientific Research and Development. In addition, the Army has trained 1300 enlisted men in advanced personnel psychology in the Army Specialized Training Program in the universities.

The nature of modern warfare makes it essential that research on military service problems be maintained at a high level of efficiency

* This address was delivered at the meeting of the Section of Psychology, October 16, 1944.

following the present war. Serious consideration must be given to the promotion and organization of military psychology in the postwar period.

SECTION OF ANTHROPOLOGY

NOVEMBER 27, 1944

DOCTOR STANLEY NEWMAN, Language Section, Information and Education Division, War Department, New York, N. Y.: *Cultural and Psychological Features in English Intonation.*

The purpose of this paper is not to present a picture of English intonation for its own sake, but rather to use the intonational phenomena of English as an illustration which can provide us with some insights into the functioning of language. The intonations afford a very convenient kind of illustration. They can be neatly, though arbitrarily, fenced off from other kinds of language phenomena. By focusing our attention on them, we can see in miniature and in tangible detail how language can function on several different levels.

When a person is talking English, a great many things are going on at the same time. On one level, he makes use of the linguistic system of English. The linguistic system, as the linguist describes it, is a purely formal system. It is made up of the phonetic pattern of the language, the changes that the sounds of the language undergo in word formation, the sequences in which these sounds can be placed. The sounds he uses are elements in a configuration of sounds that is peculiar to English and to no other language. In the linguistic system are also included the meaningful elements of the language, and the processes which govern the combining of these elements into words and sentences. The configuration of meaningful elements, too, is part of the linguistic system. When a person talks English, he draws upon the configurated linguistic system of English, which is distinctive for the English language, differentiating it from all other languages.

As he is talking English, however, he is doing more than just actualizing the linguistic system. In his speech, he is also actualizing patterns of behavior which he expresses in other, non-speech areas of activity. To take an obvious example, a hyper-active person, whose bodily movements are energetic, will usually have an energetic and vigorous manner of articulating sounds. A slow-moving person will usually have a lax articulation in speaking. The vigorous or lax character of articulation, in other words, is not a part of the linguistic system of English, even though we have vigorous and lax speech in English. This feature of articulation, however, is a part of the indi-

vidual personality system. It is related to other features of that individual's behavior.

In the same way, cultural features also find expression in language. Here we must be a bit more cautious. In our own culture, it is an ancient and highly respected practice to make cultural statements about language as if they were strictly linguistic statements. This practice is carried on by our schools, which are necessarily concerned with teaching culturally approved attitudes toward the use of language and with developing culturally useful skills in language, such as reading, spelling, and writing. All of us are exposed to this tradition, especially from the time we enter school. And, unless we are on our guard, we can be easily led into the fallacy of assigning culturally defined features to the linguistic system.

To take an example of this type of fallacy, the statement is made that using the word *ain't* is not good English. In our schools, we are not only taught notions of this sort, but we are made to believe that these notions form an essential part of English grammar. To the linguist, of course, forms are neither good nor bad; they merely exist or do not exist. His linguistic description would attempt to place the word *ain't* in its proper configuration of forms. He would say that among the irregular verbs of English there is one which has three forms in the present (or non-past) tense: *am, is, are.* The negative is formed by inserting *not* after the verb form or by a contraction of the verb with the negative. He might find that in three different dialects—dialects A, B, and C—the contracted negatives of this verb were patterned in the following way:

	A	B	C
am not	ain't	ain't	.....
is not	isn't	ain't	isn't
are not	aren't	ain't	aren't

To the linguist, there is nothing about the word *ain't* that would lead him to reject it as an acceptable part of the English linguistic system. All of the sounds in *ain't* are perfectly good English sounds. There is nothing in the verb paradigm that conflicts with its position in that paradigm. As a matter of fact, its absence (as in dialect C) leaves a vacuum in the pattern of forms.

To state that *ain't* exists and that it is a perfectly acceptable form, on linguistic grounds, in the structural system of English does not dispose of the *ain't* problem. But it does clarify the problem. It

presents the linguistic side of the case. The statement, on the other hand, that *ain't* is not good English fails to make linguistic sense because it is not a linguistic statement at all. It is a cultural statement. It has reference to the fact that certain groups in our society consider *ain't* to be a symbol of vulgarity. Once the statement is recognized as having a cultural relevance, not a linguistic one, it makes sense and takes on meaning. In terms of culturally defined attitudes, *ain't* belongs with gum-chewing and with other practices that are supposed to indicate a lack of refinement, not with the linguistic forms *isn't* and *aren't*.

Cultural evaluations of this kind have a reality and a legitimate place in a cultural frame of reference. Such evaluations cannot be argued out of existence by pointing to the linguistic validity of *ain't* or to the physiological validity of gum-chewing, which may aid the digestive process and ease nervous tension. Cultural validities very often do conflict with other kinds of validities. In specific social situations, we are constantly being called upon to resolve such conflicts. The growing child goes through a long and often painful process of learning how to adapt his physiological demands to conflicting cultural demands.

The cultural definition of *ain't* and gum-chewing fits quite naturally in a stratified society, where certain groups consider themselves to be superior to other groups, where practices in talking, eating, modes of dress and grooming, housing, etc. become charged as symbols of status. Such practices may indicate, not only the social stratum to which we belong, but also our affiliation in terms of sex, age-group, and other types of culturally defined classifications.

The evaluation of linguistic forms, such as *ain't*, on the basis of cultural classifications, is only one item in a highly elaborate network of culturally defined notions about language. This culture complex with regard to language is not limited, of course, to speakers of English. It is found among speakers of Chinese, of Arabic and Hindustani, as well as among speakers of the European languages. It is spread over a culture area that includes the so-called civilized or non-primitive cultures of today, and it has a history that must be measured in millenia, not merely in centuries. It includes many associated ideas about language: that the way in which the spoken language is used, not only indicates the social stratum of the speaker, but also his education and learning; that a native speaker does not really know his language unless he has learned the folklore of grammar and rhetoric about his language, with

all its prohibitions and exhortations; that the real language is the written form, the spoken form being merely a pale reflection of the writing; that the essence of a language is to be found in its literature, particularly in its belles lettres; and that, therefore, a society which has no written literature has no real language.

To turn now to the intonations of English, I want to give first a description of the linguistic patterns of pitch phenomena in English and then pass on to the psychological and cultural features of these phenomena. English has four distinctive intonation patterns that can be described in linguistic terms.

1. *Rising intonation.* A rise in pitch occurs on the last primary-stressed syllable of questions which can be answered by yes or no. For example:

Is his name John?
Do you live in Mahattan?
Is this the way to the railroad station?

Note that the nucleus of the rising tone is the last primary-stressed syllable—*John, -hat-,* and *rail-* in the sentences above.

2. *Falling intonation.* A fall in pitch occurs on the last primary-stressed syllable of statements and of questions that contain interrogative words, such as *where, when, how, why,* etc.

I live in Manhattan.
Where is the railroad station?

3. *Falling-rising intonation.* A falling tone occurs on the last primary-stressed syllable followed by a rising tone on the final syllable of the sentence. This intonation has the function of expressing surprise or doubt, apology, and the like.

You live in Manhattan!
I won't be able to drive you to Boston, but I can take you to the railroad station.

If these sentences are spoken with the intonation that is indicated, they will differ in pitch from the preceding two sentences only in that the final syllables of *Manhattan* and *station* will have a rising tone.

4. *Final-rising intonation.* A rising tone occurs on the last syllable of the word or word group, regardless of stress. This intonation is

found, among other places, in certain English tag constructions that can appear at the end of sentences.

I'll be able to do that, I think.
"Where do you live?" he demanded.
Close the door, Albert.

In these sentences the rise in pitch occurs on the final syllable *think*, which happens to be primary-stressed, and on the final syllables of *demanded* and *Albert*, which do not have the primary stress.

There are two general characteristics that should be noted about this linguistic description of intonation. First, these intonations are not only described in terms of pitch contours, they must also be described in terms of the location of these pitch contours with reference to the primary stress and to syllabic position. In other words, these intonations are correlated with the stress pattern of English and with the set-up of syllabic positions. The stress pattern, in its turn, is correlated in certain describable ways with the vowel configuration of English, with the consonant sequences of English, with the behavior of certain English prefixes and suffixes, with certain syntactic relations in English. The linguistic system that we call English is a close-knit structure made up of inter-related formal features. The intonations described above are linguistic features by virtue of the fact that they are related to other linguistically relevant features and are woven into the total linguistic system.

The second general point is that these four intonations do not describe all of the phenomena of pitch which occur when a person talks English. They merely represent the formal, linguistically definable constants of intonation. For example, the description of the rising intonation does not state how much of a pitch interval this rise covers. Some speakers of English habitually use a wide span of pitch; others use a relatively narrow span; still others vary considerably from day to day or even from one response to another. The point is that such differences in pitch span do not count for anything in the linguistic picture. They are linguistically non-significant variations on the same theme. Whether your rise at the end of the question is wide or narrow, it still functions linguistically as the same type of question intonation.

These two general criteria can also be applied to the psychological features of pitch phenomena. It is necessary to select those features of intonation which correlate with other psychologically relevant phenomena. It is likewise important to omit those intonational features

which are psychologically non-significant. I shall try to indicate how the psychological features of intonation shape up by giving a summary of an investigation conducted in collaboration with Dr. Vera Mather, of the Psychiatric Service of the New Haven Hospital. The purpose of this study was to determine what speech characteristics were associated with certain types of clinically defined symptoms. In order to limit the problem, the study was confined to patients with disorders of affect—patients who showed clear symptoms of motor retardation or acceleration, and depression, euphoria, or irritability. About 40 patients with manic-depressive and allied syndromes were selected for this study. Phonograph recordings were made of the patients' spontaneous speech, in conversation with the psychiatrist. In a few cases, where it was possible, recordings of the same patient were made at intervals to see whether changes in his clinical manifestations were reflected in corresponding changes in his speech.

A list of speech characteristics was drawn up to serve as the criteria for description. In addition to pitch phenomena, this list also included some of the phenomena of articulation, accent, tempo, resonance, vocabulary and phrasing, syntax, etc. Only the features of pitch, however, will be dealt with here. The pitch characteristics which turned out to be significant for this psychiatric study were the following:

1. Range of pitch: wide, narrow,
2. Pitch changes
   a. Character: gliding, step-wise
   b. Frequency: frequent, infrequent.

The patients were classified into three clinically defined groups. One was the group showing symptoms of the classical depression, such as motor retardation, sadness of mood, insomnia; and, in some cases, agitation, and self-accusatory or suicidal trends. Some of these patients had experienced similar illnesses before. A few had had previous manic phases.

The second group was made up of patients showing a chronic state of dissatisfaction, self-pity, and gloom. This state, unlike the classical depression, was not a circumscribed illness. It did not follow a definite course. Patients in this state showed some changes of mood in response to changes in the situation, while patients of the classical depression group showed no such adaptive responsiveness in mood. Furthermore, there were no clear-cut somatic symptoms associated with this condi-

tion, in contrast to the insomnia, anorexia, and constipation which were usual in patients with classical depressions.

The third group, the patients with manic symptoms, was characterized predominantly by motor acceleration and euphoria or irritability. Many of these patients had had similar attacks before or had experienced depressive phases.

The features of pitch were found to be distributed among these three clinical types as follows:

	Classical depressions	*States of dissatisfaction*	*Manic syndromes*
Pitch range	narrow	wide	wide
Pitch changes			
Character	step-wise	gliding	gliding
Frequency	infrequent	frequent	frequent

On the basis of pitch characteristics, patients suffering from states of dissatisfaction were more like the manic than like the depressed patients. It should be remembered, however, that only the characteristics of pitch are being described here. By themselves, they give a skewed version of the total speech picture. In terms of other speech characteristics, patients in states of dissatisfaction showed more resemblance to the depressed patients. For example, patients in this state, as well as depressed patients, used a level of style that was a simple colloquial type of spoken English; manic patients, on the other hand, used a more involved and elevated style, often verging on the oratorical.

For some of the patients in the depressive and manic groups, two or three recordings were made at intervals of several weeks. Clear-cut changes in the clinical picture can generally be observed in patients of these types. Over a period of weeks or a few months, many of these patients undergo a hospital recovery, as their symptoms of motor retardation or acceleration, of sadness or euphoria, of agitation or irritability become less marked. Changes are also manifested in speech. To take an example, three recordings were made of a depressed patient during his recovery period of about ten weeks. His successive recordings showed a widening range of pitch and a more frequent use of pitch changes; in the last recording, taken on the day of his discharge from the hospital, a few gliding tones appeared, whereas this patient had previously used only step-wise changes of pitch. A manic patient showed corresponding changes in the opposite direction during a rapid recovery period of about six weeks—a narrowing of the pitch range, less

frequent changes of pitch, and the use of short gliding tones in place of the previous long-drawled glides.

The characteristics of pitch selected in this psychiatric study must not be over-interpreted. They should not be regarded as being representative of the totality of speech, or as the most important characteristics or the best diagnostic clues in speech. They are an arbitrarily selected set of speech characteristics. I want to avoid misleading an unwary reader who might be tempted to believe that it is possible to psychologize a person merely by describing his intonations. Furthermore, in the group investigation just described, the characteristics of pitch could be shown to correlate very clearly with certain clinical syndromes. The uniformity of speech characteristics is the result of the type of subjects used and of the group nature of the investigation. A more complex and, in many ways, a more rewarding picture emerges from a detailed individual study, in which non-psychotic persons are used as subjects. Here, the speech material may fall into several functional sets of characteristics, which are related, not on the basis of uniformity, but rather on the basis of congruence or even opposition. This type of speech picture can reflect the compensatory relations, the conflicts and ambivalences, in the character structure of the individual.*

The culturally significant features of intonation shape up in quite a different way. When I began working on English intonation, as part of a larger linguistic study of English, I proceeded in the accepted inductive manner, recording and collecting the various intonational patterns that I heard. Several curious patterns turned up. For example, one of the patterns I heard was that used by children who would make it into a chant for teasing or taunting other children. It would occur in such sentences as "Johnny is a slow-poke, Johnny is a slow-poke." Another peculiar pattern was the one used in military commands. When commands such as "Attention!" or "Forward, march!" are given with this intonation, the final syllable is spoken with a sharp high tone, and the preceding syllable is drawled on a low tone. In the discussion of the linguistic features of intonation it was pointed out that these features were an integral part of the linguistic system, correlated to the primary stress and to the position of syllables. The peculiar nature of the taunting pattern used by children and the pattern of military com-

* The report of the psychiatric study will be found in **Stanley Newman & Vera G. Mather,** *Analysis of spoken language of patients with affective disorders.* American Journal of Psychiatry **94:** 913-942. January, 1938. The individual study referred to is described in my paper, *Behavior patterns in linguistic structure: a case study.* Language, Culture and Personality: 94-106. Menasha, Wisconsin: Sapir Memorial Publication Fund. 1941.

mands lay in the fact that neither of these patterns seemed to be related to the genuinely linguistic patterns of intonation or to any other formal features of English. In the taunting pattern, the fixity of the pitch intervals and the constancy of the melodic outline throughout the sentence was more suggestive of a musical melody than of a flexible linguistic intonation. In the pattern of military commands, as a matter of fact, the normal distribution of stress was distorted. The last syllable was always spoken with the strongest force of articulation, even in words such as *attention*, where the primary stress is normally on the middle syllable.

It soon became evident that neither of these patterns was part of the English linguistic structure. The taunting melody is obviously the same as the melodic theme of the phrase, "a green and yellow basket," in the nursery song, "A Tisket, A Tasket." Folk tunes of this kind are scarcely to be regarded as an integral part of the linguistic system of English. They are probably very old elements belonging to a European musical tradition that is shared by cultures in which different languages are spoken. The same melody is used with the same function of taunting by children who speak German, and it will undoubtedly be found among children of many different languages.

In the same sense, the military pattern is a cultural item. It is used, not only in German, which is closely related to English linguistically, but also in Persian, which is only remotely related, and in Turkish, which is not related to English at all. This technique of intoning military commands is obviously a part of a military culture complex which has been spread widely over the world. It crosses linguistic boundaries and cannot be considered a part of the English linguistic system.

Two main types of culturally relevant intonation can be distinguished. On the one hand, there are the complex intonational styles, involving not only pitch but also characteristics of articulation, tempo, resonance, etc. Here are included the styles of speech associated with certain personality stereotypes current in our culture—the voice of the preacher, the doctor, the lawyer, the politician, the silly woman, the braggart, the dunce. The stereotype of the dunce or stupid fellow appears in folk-tales all over Europe. I have heard Czech stories in which the speech of this folk individual is characterized by the same low, long-drawled glides, the same laryngeal resonance, the same hesitation pauses in Czech that I now hear in English as spoken by "Mr. Finnegan" of the

Duffy's Tavern radio program. He represents an old traditional folk character with an old traditional way of speaking, regardless of what language he happens to be using. In addition, there are certain ways of using intonation and other voice characteristics to indicate culturally standardized emotional attitudes—to indicate politeness, impatience, sophistication, anger. There are certain styles employed for certain culturally defined situations—the style used in prayer and in pulpit utterance, the style which some adults consider appropriate when addressing small children, and one which some children learn to imitate.

In contrast to these styles which involve certain types of methods of using intonation are the more distinctive melodies. These include the taunting melody used by children and the melody of military commands, mentioned above. There are also calling melodies, used particularly in calling out proper names. One can hear these every day intoned by mothers on our city streets. And there are special melodies used by street vendors—the old clothes man, the scissors man, etc.

I should like to sum up this treatment of intonation by suggesting that the general picture of intonations given here may apply not only to the pitch phenomena of English but to other language phenomena as well. First, there are the linguistic features that occur in language, features that are related one to another and go to form the closely knit structure that we call the linguistic system. There are, in addition, the psychological features appearing in an individual's use of language. These are the phenomena of language that give free play to the individual's modes of behavior, which are also expressed in and correlated with types of activity other than speech. They reflect his motor habits and also his mental (emotional and intellectual) habits. Finally, there are the cultural features found in language. They are not a part of the structure of any particular linguistic system. In their geographical distribution, they cut across linguistic boundaries and coincide, rather, with culture areas and with the spread of culture complexes. They undoubtedly, too, have a history of their own, independent of the history of the particular language in which they happen to be used.

SECTION OF BIOLOGY

NOVEMBER 10 AND 11, 1944

Conference on *"Animal Colony Maintenance."*

The Section of Biology held a Conference on "Animal Colony Maintenance," as the second in the series for the Academic year, 1944–1945. Doctor Edmond J. Farris, The Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania, was the Conference Chairman in charge of the meeting.

The program consisted of the following papers:

"Introductory Remarks," by Edmond J. Farris.

"Genetic Purity in Animal Colonies," Frederick B. Hutt, New York State College of Agriculture, Cornell University.

"The Mating of Mammals," by Carl G. Hartman, University of Illinois.

"Feeding Laboratory Animals," by J. K. Loosli, School of Nutrition, Cornell University.

"Infectious Diseases of Laboratory Animals," by Herbert L. Ratcliffe, Medical School, University of Pennsylvania and Penrose Research Laboratory, Zoölogical Society of Philadelphia.

"Remarks," by Edmond J. Farris.

"Influence of Environmental Temperatures on Warm-Blooded Animals," by Clarence A. Mills, College of Medicine, University of Cincinnati.

"Financing and Budgeting—Viewpoint of the University," by Sidney Farber, Harvard Medical School.

"Financing and Budgeting — Viewpoint of the Commercial Breeder," by C. N. W. Cumming and F. G. Carnochan, Carworth Farms, Inc., New City, N. Y.

NEW MEMBERS

Elected November 16, 1944

ACTIVE MEMBERS

Kattenhorn, Dorothy Helen, B.A., Geological Assistant, Columbia University, New York, N. Y.

King, James C., Ph.D., Entomology and Population Genetics, Private Research in Entomology (Sphingidae) and Population Genetics, White Plains, New York.

Kirkpatrick, George P., B.Sc., Astronomy and Physics, Associate Physicist, Brooklyn Polytechnic Institute, Brooklyn, New York.

Mazur, Abraham, Ph.D., Biological Chemistry, Instructor in Chemistry, College of the City of New York, New York, N. Y. (on leave); Research Biochemist, Medical Research Laboratories, Edgewood Arsenal, Maryland.

Welsh, Mark, D.V.M., Infectious Diseases of Animals, Director, Veterinary Division, Lederle Laboratories, Pearl River, New York.

ASSOCIATE MEMBERS

DeFrates, Joseph S., Ph.D., Endocrinology, Department Head, Glandular Products, E. R. Squibb and Sons, New Brunswick, New Jersey.

Long, Charles R., M.S., General Science, formerly, Research Engineer, Westinghouse Lamp Division; now, Captain, U. S. Army.

McCleary, Harold R., Ph.D., Physical Chemistry, Research Chemist, Calco Division, American Cyanamid Company, Bound Brook, New Jersey.

Robinson, Leslie G., D.D.S., Osteology, Dental Practitioner, New Westminster, British Columbia, Canada.